PROGRESS REPORT NO. 13

NASA ORDER NO. R-93

THE PROBLEM OF MAN'S GRAVITOINERTIAL FORCE ENVIRONMENT IN SPACE FLIGHT

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By

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Period Covered

1 April 1966 - 30 June 1966

Research activities during the past three months have continued along the lines described in earlier reports. A major effort is concerned with simulation studies in the Slow Rotation Room with subjects at right angles to the axis of rotation. The findings thus far are clear cut in two important respects, 1) a significant difference in susceptibility has not yet been demonstrated between the earth horizontal and earth vertical orientations, and 2) habituation to the one ensures habituation to the other insofar as motion sickness symptomatology is concerned. Although the early results are highly satisfactory, these experiments require the fabrication of individually fitted articulated molds which require about 6-8 weeks to obtain. Subjects are assigned for only 6 months, which necessitates periodic delay for fittings inasmuch as new subjects do not arrive until the old subjects are transferred.

Intensive work is continuing on the puzzling phenomenon of nystagmus induced by linear accelerations. It is difficult for some investigators to accept the possibility that it has its genesis in the otolith apparatus and difficult to explain the mechanisms if it has its genesis in the semicircular canals.

Other research work in progress covers a rather broad program involving studies in the general areas of vestibular mechanisms, observations in parabolic flight and the side effects of exposure in rotating environments. (See proposal for renewal of Project.)

Facilities

The horizontal oscillator is now operational which is an important addition to our battery of test devices. Installation of a ship motion simulator, furnished by the

Navy including its instrumentation, is progressing satisfactorily. This device will be useful, in certain modes, in studying vestibular mechanisms as well as in providing a means of inducing motion sickness.

Personnel

It was with regret that we saw Dr. Igarashi depart for Houston, Texas where he has accepted a position at Baylor University. Dr. Masao Nagaba recently of Niigata University, Niigata City, Japan has taken his place.

Completed Reports

113.* Deane, F. R. M., Wood, C. D., and Graybiel, A., The effect of drugs in altering susceptibility to motion sickness in aerobatics and the Slow Rotation Room.

114. Colehour, J. K., and Graybiel, A., Biochemical changes occurring with adaptation to accelerative forces during rotation.

115. Graybiel, A., Motion sickness. Presented at Eighth Navy Science Symposium.

116. Igarashi, M., Deane, F. R.M., and Graybiel, A., Squirrel monkey screening for functional vestibular researches.

117. Igarashi, M., Graybiel, A., Functional and histological studies of the inner ear in the squirrel monkey after exposure to high levels of gravitoinertial forces.

118. Fregly, A. R., and Graybiel, A., Acute alcohol ataxia in relation to vestibular function.

*Serial numbers.